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CLAIMS

(40)

1. Fluidising apparatus including:

a supply duct (1) for supplying liquid under pressure to a lower portion of a vessel (11) containing a fluidisable material, the supply duct extending into the vessel and including at the outlet end thereof one or more jets (212) for directing the flow of liquid into the vessel substantially transversely to the major axis of the supply duct, and

an outlet duct (12) for removing the fluidised material from the vessel, characterised in that the inlet end of the outlet duct (12) is protected from ingress of non-fluidised material by a flange member (214) located between the jets and the inlet end of outlet duct, the flange member adapted to divert the flow of fluidised material past the underside of the flange member before entering the inlet end of the outlet duct.

2. Apparatus according to Claim 1, wherein the outlet duct (12) surrounds the outlet end of the supply duct (1) and is substantially co-axial therewith.

3. Apparatus according to Claim 1 or 2, wherein the flange member (214) is fitted around a portion (204) of the supply duct that extends into the vessel (11).

4. Apparatus according to any of the preceding Claims, wherein the flange member (214) also assists in directing the fluidised material towards the outlet duct (12).

5. Apparatus according to any one of the preceding Claims, wherein the diameter of the flange member (214) is at least equal to the diameter of an adjacent portion of the outlet duct (208).

6. Apparatus according to any one of the preceding Claims, wherein the flange member (214) includes a groove (215) on its surface that faces the outlet duct (208).

7. Apparatus according to Claim 6, wherein the outlet duct (208) projects at least partially into the groove (215).

8. Apparatus according to any one of the preceding Claims, wherein the distance between the outlet duct (208) and the flange member (214) is adjustable.

9. Apparatus according to any one of the preceding Claims, wherein the supply duct (1) and/or the outlet duct (12) is substantially cylindrical.

10. Apparatus according to Claim 9, wherein the diameter of the outlet duct (208) varies along its length.

11. Apparatus according to Claim 10, wherein an upper portion of the outlet duct (208) is narrower than a lower portion.

12. Apparatus according to any one of the preceding Claims, wherein the fluidiser apparatus is partially housed within a housing (206) extending down from the base of the vessel (11).

13. Apparatus according to Claim 12, wherein a space (209) exists between the inner surface of the housing (206) and the outer surface of the outlet duct (208).

14. Apparatus according to any one of Claims 9 to 13, further including a body portion (202) surrounding the supply duct (204) and substantially blocking the outlet duct (208) apart from an aperture through which the fluidised material can pass.

15. Apparatus according to any one of the preceding Claims, further including an aperture or bore (501) acting as a bypass between the supply duct (204) and the outlet duct (208).

16. Apparatus according to Claim 15, wherein a valve (502) is fitted to the bypass aperture or bore (501).

17. Apparatus according to any one of the preceding Claims, wherein the supply duct includes an L-shaped portion (203) and is connected to a substantially horizontal pipe (1) leading to the fluidising apparatus.

5 18. Apparatus according to any one of the preceding Claims, wherein the outlet duct includes an L-shaped portion (216) leading to a substantially horizontal pipe (12) leading away from the fluidising apparatus.

19. Apparatus according to any one of the preceding Claims, wherein the supply duct (204) directs the flow of liquid into the vessel (11) in a plurality of directions substantially radially to the major axis of the supply duct.

10 20. Apparatus according to Claim 19, therein the outlet end of the supply duct is fitted with a plurality of nozzles (212) arranged radially therearound.

21. Apparatus according to Claim 20, wherein the nozzles are arranged in a plurality of vertical tiers.

15 22. Apparatus according to Claim 20 or 21, wherein the nozzles produce a fan spray.

23. Apparatus according to Claim 19, wherein the outlet end of the supply duct includes a cap (310) having a plurality of radially arranged slots (314).

24. Apparatus according to Claim 1, wherein the supply duct (1) is remote from the outlet duct (12).

20 25. Apparatus according to Claim 1, wherein the supply duct (1) is parallel along part of its length with part of the outlet duct (208).

26. Apparatus according to any one of the preceding Claims, wherein a portion (204) of the supply duct extends into the vessel (11) through the base of the vessel.

25 27. Apparatus according to Claim 26, wherein the portion (204) extending into the vessel (11) has a length shorter than the diameter of the vessel.

28. Apparatus according to any one of the preceding Claims, further including a hydrocyclone adjacent the outlet duct.

29. A vessel (11) fitted with fluidiser apparatus (10) according to any one of the preceding Claims.

5 30. A vessel according to Claim 29, wherein the vessel (11) is an open pot.

31. A vessel according to Claim 29, wherein the vessel (11) is a closed pot.

32. A vessel according to any one of Claims 29 to 31, wherein the supply duct (1) is connected directly to the outlet duct (12) via a valve (16).

10 33. A vessel according to any one of Claims 31 to 32, wherein the outlet duct (12) passes through a pressure-reducing cyclone (18).

34. A vessel according to any one of Claims 29 to 33, wherein the flow rate at the outlet duct (12) is sensed and the flow rate of the liquid in the supply duct (1) is controlled accordingly.

15 35. A method of treating fluidisable material in a vessel, the method including steps of:

supplying liquid under pressure to a vessel, the liquid being emitted into a lower portion of the vessel as one or more jets substantially transverse to the major axis of the supply duct, and

20 removing the fluidised material from the vessel, the method characterised in that the inlet end of the outlet duct (12) is protected from ingress of non-fluidised material by a flange member (214) located between the jets and the inlet end of the outlet duct, the flange member adapted to divert the flow of fluidised material past the underside of the flange member before entering the inlet end of the outlet duct.

25 36. Fluidising apparatus substantially as herein described with reference to the accompanying drawings.